

CHAPTER 8

FREIGHT

INTRODUCTION

This chapter evaluates overall freight traffic in the four county Peninsula Regional Transportation Planning Organization (PRTPO) area, which includes Kitsap, Jefferson, Clallam and Mason Counties. Efficiently moving commodities to their markets is critical to the region's economic well being. This flow of goods is dependent upon an integrated transportation network of highways, railroads, airports, ports and waterways.

WSDOT has established a procedure to measure freight travel on all of its state routes. This is referred to as the Freight and Goods Transportation System (FGTS), but this system is not yet complete and cannot be incorporated into this chapter. Nonetheless, a review of truck travel on the system was completed which provides a generalized picture of truck travel in the PRTPO area. The 1997 Freight Mobility Survey provides new information on the freight mobility issues on the regional transportation network.

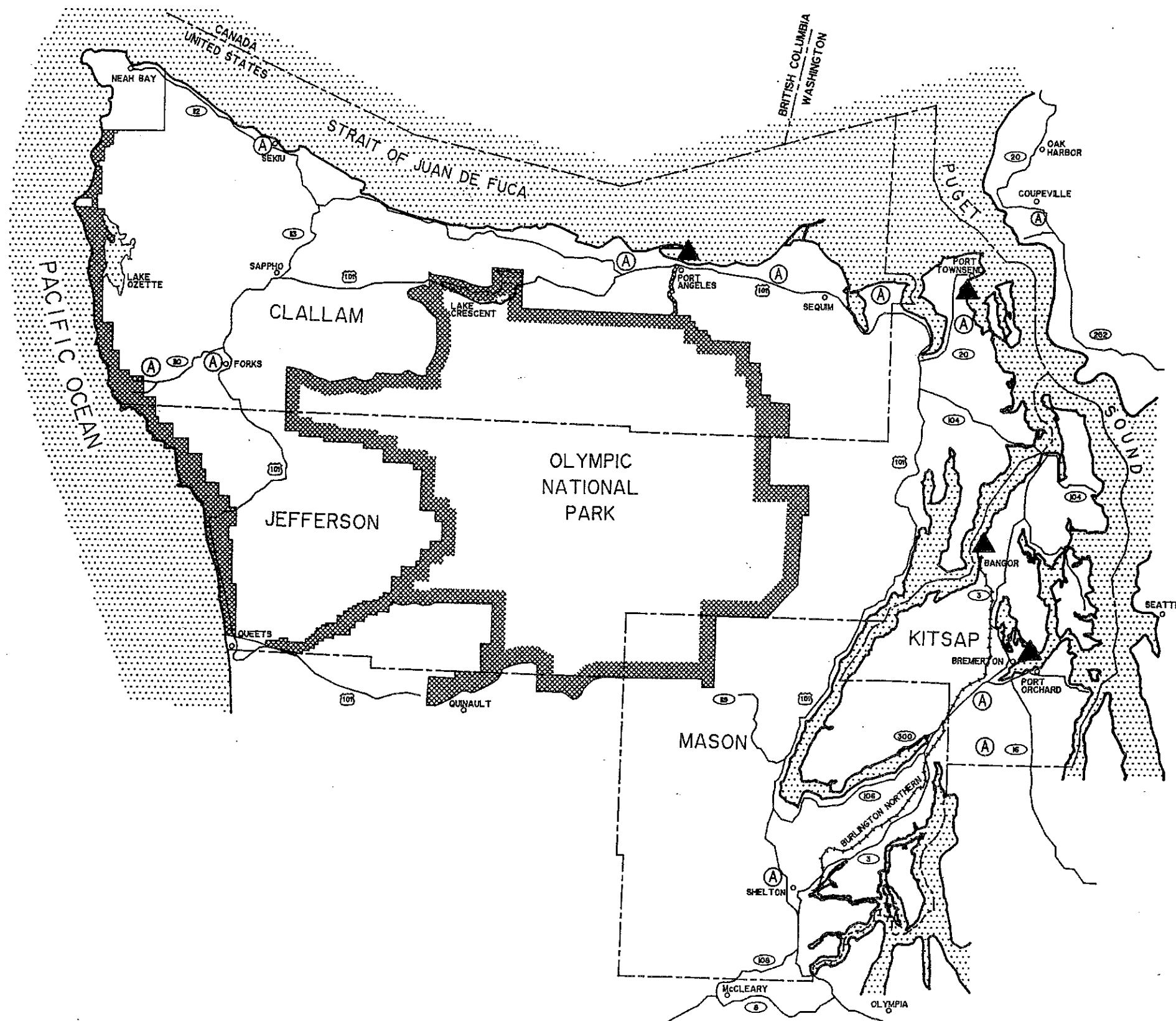
The Olympic and Kitsap Peninsulas have four forms of freight travel: truck, waterborne (steamship and barge), air and rail. Most of the freight is transported by truck, though small amounts are carried by railroad, airline and air cargo service, and by ship and barge. The waterborne commerce plays a key role, particularly within the timber industry. Air and rail freight travel make up a relatively small percentage. Figure 8.1 depicts the major forms of freight transportation in the region, including State Highway routes, those water ports through which significant volumes of freight move, airports and a rail line.

This chapter provides an overview and system description of freight activity on the Olympic and Kitsap Peninsulas in addition to findings and conclusions from the 1997 Freight Mobility Survey. This chapter is divided into six sections, as listed below.

- Historical Trends and Existing Conditions
- Impacts on Roadway Network
- Freight Mobility Survey
- Congested Roadway Segments
- Recommended Solutions and Improvements
- Conclusion

The first section, Historical Trends and Existing Conditions, describes freight activity for all modes: trucking, waterborne, air, and rail. The Impacts on Roadway Network section provides an overview of road segments with most freight activities. The following four sections present the

findings, conclusions and recommendations from the freight mobility survey including congested roadway segments and recommended solutions and improvements.



SCALE: 1" = 12 MILES

LEGEND

- (A) - AIRPORTS
- ▲ - PORTS
- +—+— RAILROAD

FIGURE 8.1

SCALE AS NOTED
DRAWN A.S.
CHECKED S.M.
DATE 3/6/88

NO.	DATE	REVISION	APP'D. BY

PENINSULA REGIONAL TRANSPORTATION PLANNING ORGANIZATION
AIRPORT AND PORT LOCATIONS

JOB NO. 935-3689
F.S. NO. _____
FILE NO. _____
SEC. TWP. RGE. _____
SHT. 1 OF 1

HISTORICAL TRENDS AND EXISTING CONDITIONS

Trucking Activity

Truck volumes in the Peninsula Regional Transportation Planning Organization (PRTPO) area were analyzed from several perspectives. Truck volume data was first examined based on roadways. This analysis was supplemented by examining truck activities on the ferries in the region. Lastly, trucking activity data at the largest port in the area was examined. For these reasons, this section is divided into four parts:

- Truck volumes on State Routes.
- Truck volumes on Ferry Systems.
- Truck volumes at the Port of Port Angeles.
- Shipping Activity.
- Rail Activity.
- Air Freight Activity.

Each of these were examined to produce a comprehensive picture of trucking activity on the Peninsula.

Truck Volumes on State Routes

Volumes of all trucking activity on State Routes within the Kitsap and Olympic Peninsulas are based on Washington State Department of Transportation (WSDOT) truck percentages of Average Annual Daily Traffic (AADT). These truck volumes are estimates and not actual counts. However, they do provide information into the trucking activity on the Kitsap and Olympic Peninsulas. Table 8.1, Total Truck Volumes, and Figure 8.2, State Route Truck Volumes, depict the 1996 total truck volumes on US and State Routes on the Peninsulas.

Trucking activity on the Kitsap and Olympic Peninsulas was analyzed in detail in PRTPO Working Paper Number 5, *Existing Freight Traffic*. The conclusions of that Working Paper identified three main points:

- Most of the total truck freight is being carried over the Hood Canal Bridge and then north towards Port Townsend, or the westbound truck freight is being carried up US 101 through Shelton.

- On a systemwide basis, the least amount of truck activity is occurring on the western side of the Olympic Peninsula on US 101 near Queets.

TABLE 8.1
TOTAL TRUCK VOLUMES
(As a Percent of 1996 AADT)

Map ID	Route	Mile Post	Highway Segment	Total Units	Percent Totals	AADT
A	101	MP 152.02	North of Jct Queets Cannery	165	22.00%	750
B	101	MP 178.49	North of Upper Hoh Road	276	23.00%	1,200
C	101	MP 193.12	North of La Push Road	675	15.00%	4,500
D	101	MP 255.13	Old Olympic Hwy Wye	1,280	8.00%	16,000
E	101	MP 282.56	East of SR 20	1,022	14.00%	7,300
F	101	MP 296.65	At Big Quilcene River Bridge	550	22.00%	2,500
G	101	MP 327.33	South of Lilliwaup St.	459	17.00%	2,700
H	003	MP 1.49	South of Arcadia Ave.	NG	NG	12,000
I	003	MP 10.76	North of Pickering Road	803	11.00%	7,300
J	003	MP 49.01	North of Ramp to SR 308	2,070	9.00%	23,000
K	003	MP 56.03	North of Pioneer Way	1,200	10.00%	12,000
L	016	MP 28.90	At Gorst	NG	NG	54,000
M	020	MP 0.09	North of SR 101 Wye	NG	NG	4,200
N	104	MP 08.87	East of SR 19 - Beaver Valley Road	1,100	10.00%	11,000
O	104	MP 20.88	West of Ritter Road	660	6.00%	11,000
P	106	MP 20.05	West of Junction SR 3	244	4.00%	6,100
Q	108	MP 0.11	After Jct. County Road	385	8.00%	4,800
R	303	MP 5.43	North of Waaga Way	NG	NG	25,000
S	304	MP 2.63	North of SR 303	NG	NG	16,000
T	305	MP 0.98	North of High School Road	NG	NG	16,000

Source: Washington State Department of Transportation
Annual Traffic Report, 1996, Permanent Traffic Counters (Mechanical)

Note: NG: Not Given

- The estimated average truck volumes on State Routes leading to and from the region's ferry terminals are SR 305 with 126 trucks per day (2% of total traffic); SR 104 at Kingston with 90 trucks per day (3% of total traffic); SR 304 at Bremerton with 21 trucks per day (1% of total traffic); SR-160 at Southworth with 54 trucks per day (3% of total traffic). Truck volumes were estimated as a percentage of total traffic volumes (AADT) as determined by WSDOT.
- All truck types (single, double, and triple axle) have some similar travel patterns.

An analysis of monthly travel for all vehicle types in the PRTPO shows that August has the highest volumes for any month of the year, while the lowest volumes occur in the winter months -- November through February . The travel data is for all trips and does not distinguish between truck travel and other types of travel; however, it is an indication of travel patterns on the Peninsulas. This seasonal variation in traffic coincides with the most popular tourist months, indicating a possible roadway conflict between trucks and recreational vehicles..

Truck Volumes on Ferry Systems

Two ferry systems exist in the PRTPO area that are involved in transporting freight. They are the Washington State Ferries and the privately owned Black Ball Transport route between Port Angeles and Victoria, British Columbia. The Washington State Ferry system provides service to several locations in the PRTPO area, including four terminals in Kitsap County and one in Port Townsend. Black Ball Transport only operates out of Port Angeles.

Washington State Ferries

The Marine Division of Washington State Department of Transportation operates ferry transport to various cities, islands, and peninsulas in western Washington, including Kitsap County and Port Townsend.

The Marine Division maintains records for Kitsap County and Port Townsend on regular and commercial vehicle travel by route. **This data, however, is not directly comparable to the estimated daily truck count data on the US and State Routes because the collection methods vary.** For the Marine Division, trucks are part of the commercial vehicle class. Commercial vehicles include all oversized vehicles. WSDOT data is based on vehicle axle count estimations. Nonetheless, review of the Marine Division data on State ferries does provide additional insight into freight activity on the Olympic Peninsula.

Table 8.2, WSDOT 1997 Ferry Ridership, shows the annual volume of total, regular and commercial vehicle travel on ferry routes to Kitsap County and Port Townsend. The Oversized/Commercial column shows RV's and trucks and was obtained by subtracting regular commuter and other traffic from total vehicles. According to these figures (as shown in Table 8.2),

the highest oversized vehicle volumes occur on the Edmonds/Kingston route with 86,003 vehicles per year. The second highest volumes occur on the Seattle/Bainbridge Island route with 66,894 vehicles.

The third highest volumes occur on the Fauntleroy/Vashon/Southworth route with over 44,528 oversized vehicles per year. The Port Townsend/Keystone route has about 23,031 oversized vehicles per year, and the Seattle/Bremerton route carries 10,804 oversized vehicles.

Table 8.3, Comparison of Daily Commercial Traffic and Truck Count Estimates, contains the estimated average daily oversized/commercial volumes by ferry route. For example, the Seattle/Bainbridge Island annual oversized/commercial volumes of 66,894 averages to 183 vehicles per day. Also depicted in Table 8.3 are the WSDOT estimated 1995 truck volumes (based on the total traffic volume) nearest the ferry terminals in Kitsap County. The differences in the two volumes is that the state ferry system includes all oversized vehicles (RV's and trucks) but WSDOT only represents estimated truck volumes.

Black Ball Transport

Black Ball Transport provides private ferry service from Port Angeles, Washington, to Victoria, British Columbia in Canada. Table 8.4, Black Ball Transport, Inc. 1997 Traffic Statistics, M.V. Coho, depicts the traffic statistics for all vehicles traveling on the Black Ball ferry. Both the monthly volume and the annual total truck traffic are depicted for trucks and truck trailers.

Truck volumes utilizing the Black Ball Transport service have decreased by approximately 50% since 1991 (1991 annual truck traffic was 10,447 trucks as compared to 5,197 trucks in 1997). The 1997 data indicates that there is a slight increase in truck volumes over the summer months, with about 600 vehicles in July of 1997. January had the lowest volume, with approximately 145 trucks.

TABLE 8.2
WSDOT 1997 FERRY RIDERSHIP

TOTAL VEHICLES	REGULAR AUTO	COMMUTER	OVERSIZED/ COMMERCIAL		OTHER
			Count	Percent	Count
ROUTE	Count	Percent	Count	Percent	Count
Seattle/Bremerton	756,796	58%	439,155	32%	246,028
Seattle/Bainbridge Island	2,275,101	45%	1,1014,185	44%	1,014,171
Fauntleroy/Vashon/Southworth	1,897,872	28%	534,671	64%	1,217,053
Edmonds/Kingston	2,120,775	57%	1,199,599	30%	639,806
Port Townsend/ Keystone	371,304	70%	260,383	11%	42,102
				6%	23,031
				4%	86,003
				2%	44,528
				3%	66,894
				2%	10,804
				8%	60,809
				8%	179,760
				6%	101,620
				9%	195,367
				13%	45,788

TABLE 8.3
COMPARISON OF DAILY COMMERCIAL TRAFFIC AND TRUCK COUNT ESTIMATES

Routes	Average Annual Daily Commercial Ferry Traffic ⁽¹⁾	WSDOT Truck Count Estimates Near Ferry Terminals ⁽²⁾
Seattle/Bremerton	30	21 (1%) ⁽³⁾
Seattle/Bainbridge Island	183	126 (2%)
Fauntleroy/Vashon/Southworth	122	54 (3%)
Edmonds/Kingston	236	90 (3%)
Keystone/Port Townsend	63	N/A N/A

(1) Source: Based on annual volumes provided in Table 8-2
(2) Source: Washington State Department of Transportation (ADT 1995)
(3) Percentage of total ADT 1995 traffic

TABLE 8.4

**BLACK BALL TRANSPORT, INC.
1997 TRAFFIC STATISTICS, M.V. COHO
ALL VEHICLES**

Month	Autos	Trailers	Campers	Motor Homes	Trucks & Truck Trailers	Stages	Other	Total	Bikes
January ⁽¹⁾	973	29	17	26	145	4	2	1,196	11
February	2,019	35	15	52	298	N/A	4	2,423	28
March	5,231	91	55	132	380	12	28	5,929	58
April	6,638	99	66	140	433	25	45	7,446	148
May	10,283	165	110	313	519	130	190	11,710	290
June	14,392	305	151	496	509	124	278	16,255	322
July	19,517	644	282	823	611	144	655	22,676	711
August	20,990	694	312	878	477	127	845	24,323	749
September	15,229	308	194	616	542	118	282	17,289	547
October	8,211	107	63	185	445	15	46	9,072	107
November	4,426	68	23	86	449	N/A	12	5,064	66
December	3,921	64	33	94	389	10	9	4,520	35
Totals	111,830	2,609	1,321	3,841	5,197	709	2,396	127,903	3,072

Note: (1) Out of service, January 19 - February 2, 1997
Current Blackball Ferry schedule may vary from 1997 schedule.

Truck Travel to the Port of Port Angeles

This section focuses on truck travel to the Port of Port Angeles marine terminals. Shipping activity at the Port is discussed in a later section. As can be seen in Figure 8.3, Port Angeles Harbor Existing Waterfront Usage, the port and private marine terminals are located to the west of the Black Ball ferry terminal. The primary access to the industrial waterfront is via the Tumwater Truck Route and along Marine Drive. The Port is dependent upon the logging industry, and trucking activity at the Port primarily consists of log trucks bringing in cargo for export. Some finished lumber is brought in for shipment, however, the bulk of the trucking is the delivery of raw logs.

After arriving at the Port area, the logs are either stored on land or in the water. Those stored on land are later transported to ships. Those stored in the water are either later loaded from the water to ships or made into rafts and towed to mills in the Puget Sound area, such as those in Tacoma or Everett.

In 1997, the Port log dump received 22,711 truck loads of logs, or approximately 84 loads per day. In addition, because of the limited log storage space in the marine terminal area, some trucks deliver loads directly to shipside during ship loading. These loads originate at log storage areas south and west of the City. The Port estimates there were 970 truck loads delivered directly to ships in 1997.

Trucking activity to the Port has declined in recent years because of reduced logging activity (see Table 8.5). The Port has been examining ways to diversify its activities. At this time, the Port is considering several possible options, including ship repair and temporary berthing.

In addition to the trucking activity at the Port itself, the mills located on the Port Angeles harbor (see Figure 8.3) also generate trucking activity. This activity primarily consists of trucks transporting milled products to the Tacoma and Seattle areas.

Shipping Activity

Port of Port Angeles

The Port of Port Angeles has four berths ranging in depth from 34 feet to 45 feet. All have expected economic life spans of about 20 years. Logging and related products are the major outbound cargo, but the Port does have the berths capable of handling other products (*Port of Port Angeles Comprehensive Scheme of Harbor Improvements*, TAMS, 1986, pages 3.1.1 and 3.1.2). The Port is limited because it has insufficient terminal support area and backup land (*Ibid*, page 2.2).

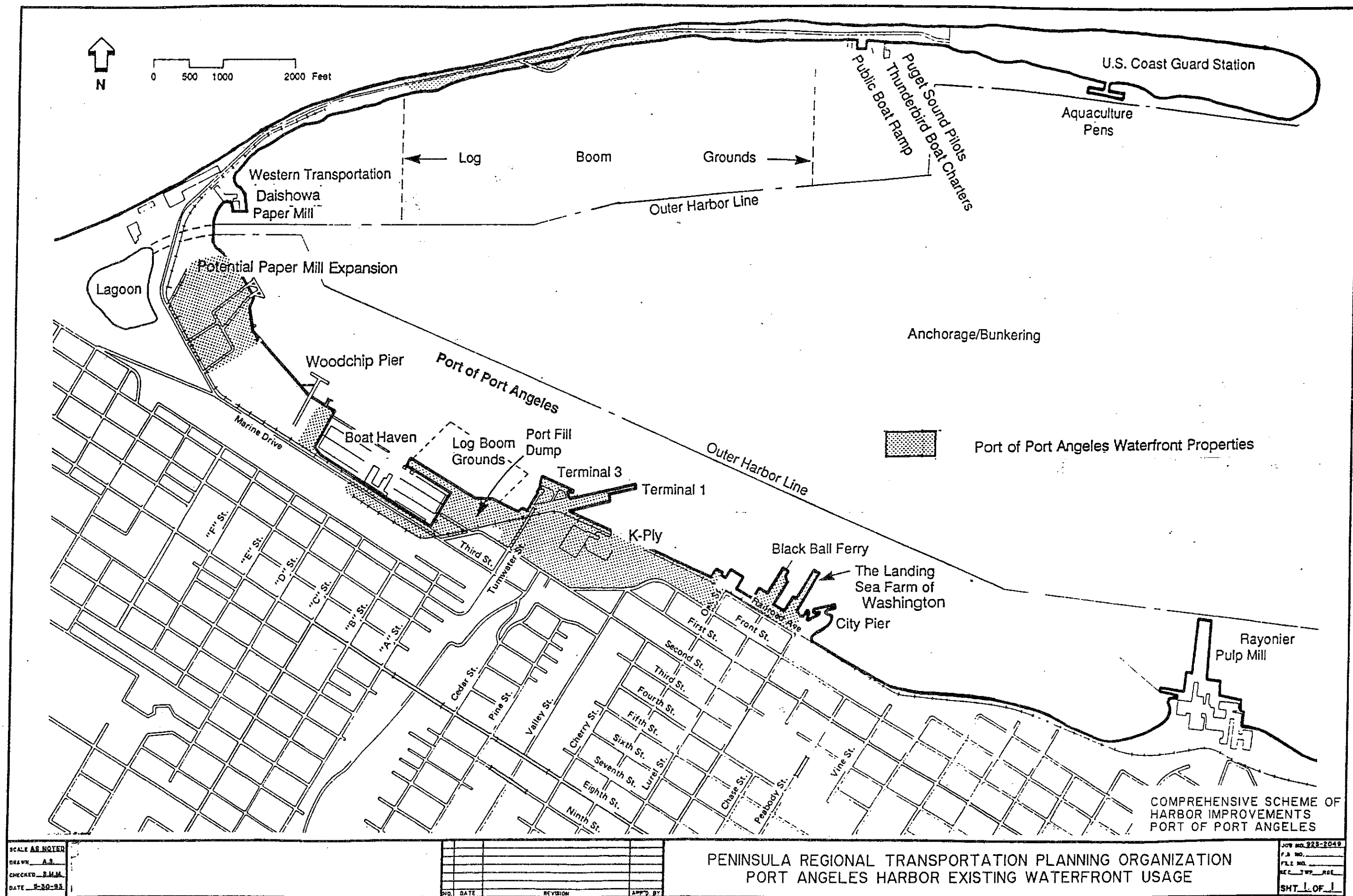


FIGURE 8.3

TABLE 8.5

**PORT OF PORT ANGELES' ANNUAL EXPORTS AND
DOMESTIC SHIPMENTS OF LOGS 1975-1997**

Millions of Board Feet, Scribner Scale

Year	Exports	Domestic Shipments	Total
1975	221.1	24.7	245.8
1976	300.2	32.4	332.6
1977	280.2	34.0	314.2
1978	295.6	23.1	318.7
1979	439.8	38.4	478.2
1980	276.4	53.1	329.5
1981	159.5	20.3	179.8
1982	166.5	16.8	183.3
1983	216.1	31.3	247.4
1984	250.8	49.0	299.8
1985	327.4	62.5	389.9
1986	318.8	39.7	358.5
1987	264.1	47.1	311.2
1988	310.7	47.3	358.0
1989	330.9	76.3	407.2
1990	256.5	48.3	304.8
1991	164.2	33.0	197.2
1992	150.6	35.8	186.4
1993	139.0	52.1	191.1
1994	65.2	49.9	115.1
1995	60.7	40.1	100.8
1996	63.6	44.3	107.9
1997	41.7	46.4	88.1

Source: Port of Port Angeles' (POPA) statistical data

Note: Some of POPA's domestic shipments ultimately are exported from other Puget Sound Ports.

The Port of Port Angeles primarily exports logs and other related timber products such as pulp, lumber, and wood chips. Inbound products vary more widely and include pulp, chemicals, and petroleum products (*Port of Port Angeles Comprehensive Scheme of Harbor Improvements*, page 3.2.1). In addition to the various products shipped into and out of the Port, shipping activity also has monthly variations, as depicted in Figure 8.4, Port of Port Angeles, Monthly Vessel Arrival Pattern. Spring and summer appear to be the busiest seasons, with shipping activity falling off in the fall and winter months.

Port of Port Townsend

The Port of Port Townsend owns and operates two primary facilities (1) Port Townsend Marina, Boat Haven, Shipyard, and Industrial Park, and (2) Jefferson County International Airport.

The Boat Haven contains moorage capacity (542 slips) for recreation, fishing, and commercial vessels. This 40-acre upland site is the home of Jefferson County's thriving marine trades industry. Businesses situated at the Boat Haven and Shipyard are internationally known for high technology marine fabrication and commercial fiberglass composite, wooden and steel vessel construction and repair.

The site is fully serviced by sewer and water and it is zoned light industrial under Port Townsend zoning codes. Other significant infrastructure includes Port-operated 60 to 70 ton mobile straddle lifts, marine vessel wash-down facilities, commercial fueling and full fire suppression. The Shipyard consists of a 300-ton mobile marine straddle lift with attendant, additional lift and work dock capabilities.

Jefferson County International Airport features a newly constructed 3,000 foot runway. One charter operation provides charter service to Seattle-Tacoma International Airport and other regional locations. Aircraft maintenance, fuel, training, and restaurant services are available. The site is served by the Port Townsend municipal water system. Sewage disposal is through an on-site septic system. During August 1994, the Port completed a comprehensive development plan. The plan identified aviation and light manufacturing opportunities and locations, and sites for additional hangar, retail, and warehouse development. Since then, five aircraft hangers, and an aircraft maintenance facility have been constructed.

Separate from the Port of Port Townsend and about a mile east is the Port Townsend Paper Corporation. The Port Townsend Paper Corporation owns a 600 foot dock which allows the company to accommodate large ocean-going vessels. For many of the large vessels, the ingress and egress must be well planned. Because the water is not deep enough to accommodate fully loaded ocean going vessels, ships cannot leave the paper mill's dock fully loaded; otherwise, they will be too heavy, will not have enough draft, and will run aground. Barges are also used by the paper company, and with their more shallow draft, they are able to more easily leave the dock area and move to deeper waters.

Figure 8.4 Port of Port Angeles Monthly Vessel Arrival Pattern

Source: Port of Port Angeles Statistical Data

While marine shipping is often more economical than trucking, the Port Townsend Paper Corporation, generates over 40 in-bound trucks per day. In-bound freight consists primarily of raw materials, such as wood chips, while outbound truck freight consists of paper goods.

The Port also owns the Point Hudson facility which provides transient moorage for up to 102 vessels, and is home to nine marine trades businesses, a hotel, restaurant, and the Wooden Boat Foundation.

The Port of Shelton

The Port of Shelton is located south of the Hood Canal along Oakland Bay. While adjacent to water, this port has no shipping activity; freight activity is conducted by truck or by rail. The rail line is a part of the same line that serves the Bremerton Naval Shipyard and the Bangor Submarine Base. The Port of Shelton also has an airfield.

The Port of Shelton has several tenants and the activities at the port range from chip production to machinery and fabrication. Five of the tenants are timber-related: chip production from raw timber, pole and piling production, and panel production at the saw mill. Another major tenant activity is in the area of machinery and fabrication. Specifically, one tenant dismantles Boeing 727's and 737's. The rail line is used for export from Shelton south to the Olympia area and beyond. Lumber is the main export, particularly poles and pilings, which are shipped to California for treatment.

Mason County and the Shelton areas are also important areas for Christmas trees and for evergreens for Christmas boughs and swags. Consequently, during the eight weeks before Christmas there is a notable increase in trucking activity as these goods are transported from the fields to the markets. Christmas trees from the Mason County area are shipped all over the United States and all over the world. Trees going to the southwestern and Asian markets leave the fields during the first part of the season. Those to the Southwest are trucked via US 101 and Interstate 5 while those to Asia are trucked to Seattle and then shipped across the Pacific.

Specific information on the volume of trees shipped, the number of trucks and their routes is not readily available. Each individual Christmas tree company maintains their own records. The companies contacted expressed support for detailed study of truck movement, but such an in depth study was beyond the scope of the current project.

Navel Undersea Warfare Center

The Naval Undersea Warfare Center (NUWC) at Keyport in Kitsap County functions as headquarters for several depots, ranging, and testing activities, including three-dimensional under-sea test ranges. While Keyport is the main facility, there are also four "detachments" located throughout the west: Indian Island, Washington; Hawthorne, Nevada; Lualualei, Hawaii; and San Diego, California.

Information was not available for two military installations: Indian Island and the Manchester Fueling Station. Several efforts were made to gather information, but response was not forthcoming. Indian Island is located east of Port Townsend at the mouth of Admiralty Inlet, which leads to both the Hood Canal and to the Seattle/Tacoma Metropolitan area. The Island primarily functions as a loading station. The Manchester Fueling Station is in Kitsap County, east of Port Orchard. Presumably, the fuel is stored there for use by naval ships located across the Sinclair Inlet at the Puget Sound Naval Shipyard in Bremerton.

Puget Sound Naval Shipyard

The Puget Sound Naval Shipyard is located in Bremerton, adjacent to the WSDOT ferry dock. The Shipyard is home base to five or six vessels, including two supply ships and two nuclear cruisers. Traditionally, the Shipyard has been primarily involved in overhaul and repair of ships and submarines. But now the Navy is downsizing, and the Shipyard is involved in recycling submarines. This process essentially consists of taking the submarines apart and shipping the metal by rail to other destinations for melting and recycling.

In addition to exporting metal for recycling, the rail lines also supply the Shipyard with material and coal for its steam plant. The coal shipments are expected to decline in the future because the Shipyard plans to convert its coal plant to gas. Trucks also supply goods and materials to the Shipyard, but no specific volume count for truck traffic was available.

Bangor Naval Base

Bangor Naval Base is located on the western side of Kitsap County along the Hood Canal. The Naval Base is the shore support for the Ohio Class Trident Submarines. The Trident program consists of three parts: the nuclear powered submarine, the missile, and the shore support for both the submarine and the missile. Bangor Naval Base is responsible for maintaining both the submarines and their crews. Some goods, such as coal, are supplied to the base by rail.

Rail Activity

The only active railroad line in the four county PRTPO area is in Kitsap County. The rail line runs north through Shelton and continues up to the Bangor Naval Station. This line is owned by the US Navy and is operated by the Burlington Northern Railroad. There is a spur line that cuts off of this branch line and runs into the Bremerton Naval Shipyard.

The Navy is the only shipper on this line. As mentioned earlier, the rail line is used by both Puget Sound Naval Shipyard and by Bangor Naval Base. The type and quantity of freight shipped on the line varies. The commodities include munitions, parts and machinery, and other supplies that are needed at the naval facilities. The latest count available from WSDOT indicated that in 1991, there were 175,000 ton-miles of freight shipped on the line (a ton-mile is equal to one ton of freight

carried one mile). This was the only specific data available about freight shipped on the line.

In Port Townsend, there is a small remnant of the former Port Townsend to Port Angeles rail line. This line had been the Olympic Peninsula Subdivision of the Chicago, Milwaukee, St. Paul and Pacific Railroad. Upon this railroad's bankruptcy and subsequent abandonment of the line, a shortline operator ran the line until that operator went bankrupt and shut down in 1984. The segment that remains in Port Townsend is approximately two miles long and runs from the barge/carfloat docks to the Port Townsend Paper Company. Although this line is not currently operating, it is intact and could be returned to service.

Air Freight Activity

The four county region has a total of eleven airports. Of these airports, only the William R. Fairchild Airport in Port Angeles has regularly scheduled commercial air service. The four cargo operators at the Port Angeles airport include Horizon Airlines, Federal Express, United Parcel Service, and Pony Express Air Service. There was a total of 335 tons of air cargo originating or terminating at the airport) that passed through this airport in 1992.

The airport master plan does not contain any relevant information about landside operations, so there is no specific information about associated truck traffic. United Parcel Service and Federal Express have air service to the airport five to six days a week, so there is at least one truck from each company meeting the air cargo flight. With one or two other daily cargo/passenger flights to the airport each day, there are an estimated four or five trucks going into the airport each day. In contrast, the Forks Airport has no scheduled service. This airport is a general aviation facility that has an occasional charter flight in to bring parts for logging companies and to provide emergency or "as needed" service.

IMPACTS ON ROAD NETWORK

Freight travel, like recreational travel, has several impacts on roadways. The road's design characteristics -- such as width, alignment, and sight distance -- may be inappropriate for trucks. The size of the trucks can obstruct the sight distance of other vehicles, which may impact roadway alignment. The pavement structure is also impacted by the heavy weight of the trucks. Trucks, like RV's, may require different turning radii or driveway access.

Consequently, transportation improvements stemming from freight travel depends on the roadway, the type of activity (e.g., turning or passing), and the type of vehicles using the roadway, such as a concentration of trucks. To determine the type of transportation improvements needed, a freight mobility survey was conducted, as described in the next section.

The analysis of freight activity in the PRTPO area indicates that Port Angeles is the center for freight activity and may be the focal point of freight-related roadway improvements. According to WSDOT truck estimates, the Port Angeles area has one of the highest truck volumes of all sites

analyzed. Port Angeles also has the largest shipping activity, with both the Port of Port Angeles and Black Ball ferry service located there. In addition to the waterborne activities, the Port and Black Ball attract trucking activity, as do the active two pulp mills located on the waterfront.

The Port Angeles area also has the most active airport, the William R. Fairchild Airport. This airport has three commercial cargo flights five or six days a week and generates about 8 truck trips per day. Because Port Angeles has the most active airport, water ports, and trucking activity, it can be seen as the hub of freight activity in the PRTPO region.

Kitsap County also has significant freight activity. While the data is limited, it does indicate that the Puget Sound Naval Shipyard and Bangor Naval Base are major freight destinations, but the amount of freight travel arriving by truck as compared to that arriving by rail is unclear. However, in addition to these destination points, Kitsap County also has high volumes of through freight travel, both on the highway system and on the ferry system.

As an effort to assist the PRTPO in addressing freight mobility issues on the Olympic and Kitsap Peninsulas, a freight mobility study was conducted, in 1997. The findings from this survey are presented in subsequent sections.

FREIGHT MOBILITY SURVEY

Trucking activity influences roadway capacity and design as well as the identification of future transportation corridors. The purpose of the freight mobility survey was to identify road network barriers and critical roadway segments, and recommend improvements and strategies to support the freight industry within the PRTPO area. Additionally, it is anticipated that this study will provide the PRTPO with an overview on the quantity and types of commodities transported throughout the region. The first phase of this study included state routes and ports. The primary goals of this study were to:

1. Provide initial analysis of the existing data to identify issues, concerns and both short-term and long-term improvements to the transportation network, and
2. Establish a program for obtaining additional data to determine the impact of trucks on the roadways, and to identify where specific improvements may be necessary in the region.

The initial efforts consisted of collecting available data pertinent to the analysis of freight mobility issues on the regional transportation network.

The sources of data included:

- Washington State Department of Transportation (WSDOT)
- Washington State Department of Natural Resources (DNR)

- Local economic development councils
- Port authorities
- Major industrial and manufacturing shippers
- Freight haulers
- Washington State Patrol (WSP).

Additional freight movement information was collected by user surveys, and direct personal interviews with the trucking industry, and total vehicle/truck counts at selected locations.

Data Collection

Information regarding freight travel patterns and weight of cargo transported provides valuable insight on current and future highway transportation demands, impacts, and identification of system improvements and strategies. It includes data such as seasonal traffic changes, type of trucks, and typical cargo/vehicle weight. Cargo content is an important determinant of cargo weight. For example: The timber industry tends to be associated with relatively heavy cargo loads and multiple trailer trucks (as opposed to consumer products being delivered to stores in single trailer units).

Existing freight mobility data was collected and gathered from resources such as:

- WSDOT Annual Traffic Reports (1994 and 1995)
- Weigh station information provided by the Washington State Patrol (WSP)
- Various reports by the Washington State Freight Mobility Advisory Committee
- Reports by the Puget Sound Regional Council (PSRC)
- Labor Market and Economic County Profiles for Clallam, Jefferson, Kitsap and Mason counties
- The Eastern Washington Intermodal Transportation Study (EWITS)
- Washington Timber Harvest and Mill Survey Reports
- Various reports on port/dock studies and travel patterns/traffic within specific areas of the region

All of the documents that were collected and reviewed for this study are listed in bibliographic form in Appendix A. Some of the information contained in those documents is summarized below (as it applies to this study). To review the complete documents, see the appropriate appendix.

Direct personal interviews were conducted with both freight haulers and their customers (ports, mills, etc.). This included both in-person and over-the-phone interviews. The initial effort included obtaining information from the ports (Port of Port Angeles, Port of Port Townsend, Port of Bremerton, and Port of Shelton), the main mills, and members of the Peninsula's trucking industry, those that transport both general commodity and lumber/wood products. The purpose

of the interview survey was to gather information related to freight traffic and commodity volumes in and out of the region; such as, main travel routes, average trips per day, peak travel times, problem areas, etc. An example of the interview topics is provided in Appendix B.

The total vehicle/truck counts were performed at six selected intersections within the study area during a three week period, from June 16 - July 1, 1997. The selected intersection included:

- SR 104/SR 3 at the Hood Canal Bridge (18-Jun-97)
- SR 3 north of Shelton (19-Jun-97)
- SR 3/SR 16 at Gorst (24-Jun-97)
- SR 104/SR 19 south of Port Townsend (26-Jun-97)
- US 101/SR 112 west Port Angeles (1-Jul-97)
- US 101 at Deer Park, east of Port Angeles (1-Jul-97)

Economic Information

The population growth in the Olympic Peninsula region has brought with it an inevitable increase in overall traffic, changes in the types of users and travel, changing traffic patterns and traffic congestion. This growth in traffic directly affects freight movement in and out of the region and may ultimately threaten the long-term vitality of the region's economy.

The economic value and content of cargo transported directly affects the economic vitality of the region. Economic employment data, including type of industry and total wages paid (1995) for each of the four counties, is provided in Appendix C (refer to Washington State Labor Market and Economic County Profiles for more detailed economic information). Economic employment data are also summarized within each ZIP code (Appendix C).

The economy for Jefferson and Mason counties has historically been based on manufacturing, in particular, the lumber and wood products industry. The Washington State Labor Market and Economic County Profile for Mason County indicates that approximately 77% of the wages paid in the manufacturing industry is within the lumber and wood products category. However, lumber and wood products industry in Jefferson County has declined and currently the paper and associated products is the major manufacturing sector, with Port Townsend Paper as one of the biggest employer.

Underlying virtually all aspects of Kitsap County's economy is the federal government (were approximately 53% of all wages are paid in Kitsap County), with approximately two of every five jobs in the county within the government (refer to Kitsap County Profile). Furthermore, the government supports both the service and trade sectors (approximately 30% of all wages paid).

Clallam County built its economic base upon the lumber and wood products, as well as the paper and allied products. However the economy has shifted due to substantial gains in the county's

services production industries, particularly government, services, and wholesale and retail trade (representing approximately 70% of the county's total wages paid). Currently approximately 16% of total wages paid in the County is within the manufacturing industry of which approximately 83% of wages paid is based on lumber, plywood, log exports, pulp and paper, and shakes and shingles products.

Summary of Available Freight Mobility Data

Communities benefit from the economic activity associated with the freight transportation system through jobs, taxes generated, opportunities for exporting products, and access to larger variety and quantity of consumer goods. As communities grow and experience increased traffic volumes and congestion, there are more conflicts between road users; general vehicles and local residents, tourists and freight haulers. Transfer points, where goods are off-loaded from one mode to another, are often the weak links or chokepoints in the freight movement system. Improvements to the network system of moving goods and people are necessary to keep up with the expanding economy and population growth.

Lumber and wood products represent the largest portion of cargo transported on the highways within the study area. Large volumes of timber products are shipped from the Olympic Peninsula Region to the major ports in Puget Sound for export, and a large percentage of this freight is moved by truck. Major transportation corridors within the study area are based upon a network of state routes that merge with US Route 101. Truck traffic access to and from the Olympic Peninsula is primary from I-5 to SR 16 across the Tacoma Narrows Bridge. SR 16 travels north and south in Kitsap County and merges with SR 3. Other major truck traffic routes include:

- SR 3 which travels north and south through the central and northern Kitsap County and heads southwesterly through Belfair, Allyn, and Shelton (in Mason County) before merging with US 101. SR 3 connects with SR 104 at the Hood Canal Bridge.
- US 101 which travels south through Shelton and north along Puget Sound inlets and the Hood Canal. US 101 is the principal route to and from Jefferson and Clallam Counties as it circumnavigates the Olympic Peninsula, going through towns like Sequim, Port Angeles and Forks in Clallam County.
- SR 104 which connects Kitsap and Jefferson counties via the Hood Canal Bridge and links to US 101.
- SR 20 which links Port Townsend and US 101 and SR 19 which links Port Townsend and SR 104.
- Major Washington State Ferries connections such as Bremerton and Bainbridge Island to the Seattle area, and Kingston to South Snohomish County. Also, the Black Ball Transportation Company provides ferry service between Port Angeles and Victoria, British Columbia.

WSP

Washington State Patrol (WSP) operates portable truck scales along major routes in Mason, Kitsap, and Jefferson counties, and uses both portable scales and permanent scale-houses in Clallam County. WSP only maintains records of the number of trucks weighed, and those trucks that exceed the maximum weight limits. Information on total vehicles weighed, excess weight fines and location of scales for the years 1994 through 1996 is provided in Appendix D. The majority of the vehicles weighed within the study area are trucks traveling in and out of the Port Angeles area.

WSDOT

Recorded volumes of trucks on State Routes within the Kitsap and Olympic Peninsulas are based on WSDOT truck percentages of Average Annual Daily Traffic (AADT). These figures are obtained from annual estimates and actual counts. Truck data for county roads and smaller cities is not as complete.

Table 1 summarizes the total truck volumes for 1994 and 1995 on US and State Routes within the study area, and Figure 1 depicts these truck volumes. The table shows that the area around Forks (US 101) represents the largest percentage of the Region's truck activity, or approximately 25% of the total traffic, and about 10% of the increase in the truck traffic from 1994 to 1995. The majority of these trucks are affiliated with the timber industry in the western part of Jefferson and Clallam counties. Approximately 15% of the total traffic at US 101/SR 104 intersection represents truck traffic traveling over the Hood Canal Bridge. The highest total traffic volume and tonnage is through the SR 3/SR 16 intersection (at Gorst). This information also indicates that the majority of the traffic entering the Peninsula comes across the Tacoma Narrows Bridge on SR 16. Total average daily traffic south of the SR 3/SR 16 intersection is approximately 11,000 vehicles; and north of this intersection the total traffic increases to 68,000 vehicles (or approximately six fold increase). Truck traffic at this location is in the range of 6 to 8% of the total traffic.

Freight tonnage information from WSDOT indicates that over 4,000,000 tons/year of freight moves on the following road segments on the Peninsula (Appendix E):

- From the Tacoma Narrows Bridge, along SR 16, through Gorst and north to the SR 3/SR 305 junction at Poulsbo
- On US 101 in and around the Port Angeles and Sequim areas
- Between the SR 104/SR 19 intersection and the Hood Canal Bridge (SR 104/SR 3)

Table 8-6 summarizes the 1994 truck count information on highways within the region and focuses on the maximum, minimum, and average number of trucks on the route length as well as the percentage of truck traffic to total traffic. The table shows that SR 16, at the Tacoma Narrows Bridge, has the most truck traffic followed by SR 3. The routes between Forks and Port Angeles (SR 117, SR 112, SR 113) have the highest percentage of trucks to total traffic as noted

in other studies.

TABLE 8-6
1994 TRUCK COUNT INFORMATION ON STATE HIGHWAYS

Route	Truck Count Maximum	Truck Count Average	Total Traffic Average	Percent Trucks of Total Traffic
16	2,720	2,720	34,000	8.0%
3	4,480	1,249	16,250	7.7%
117	1,512	1,211	5,267	23.0%
104	1,200	884	10,067	8.8%
101	3,850	786	7,486	10.5%
305	850	640	16,000	4.0%
20	2,160	576	8,229	7.0%
19	594	528	7,050	7.5%
112	430	294	2,278	12.9%
113	207	207	900	23.0%
106	150	150	2,500	6.0%
119	60	60	1,500	4.0%
110	60	47	1,063	4.4%

Reference: 1994 Annual Traffic Report, WSDOT

Additional information from WSDOT regarding 1995 average truck volumes on State Routes leading to and from the region's ferry terminals reveal that trucks are a small percentage of the total vehicles using ferries: SR 305 with 126 trucks per day (2% of total traffic); SR 104 at Kingston with 90 trucks per day (3% of total traffic); and, SR 304 at Bremerton with 21 trucks per day (1% of total traffic). A detailed list and a map of 1995 truck traffic at the ferry terminals and projected truck traffic (at locations approaching ferry terminals) in the year 2020 are provided in Appendix F.

EWITS

The Eastern Washington Intermodal Transportation Study (EWITS Report No. 9) collected information on traffic and commodity flow including personal interviews of 28,000 truckers over a one year period during 1993. This study concluded that both the Port Angeles and Sequim areas were the major generators of freight traffic within the region. The majority of truck trips support the area's timber-based economy and the needs of the local population. The average daily number of trucks originating in Port Angeles was 72, 65 for Shelton, 55 for Sequim, and 38 for Port Townsend. Over 80% of the truck trips originating from these areas had destinations within Western Washington, with Seattle identified as the most frequent city destination.

This study showed that the wood and paper processing facilities located in Port Angeles are the main influences of local truck transportation needs (11% of total trucks from the Olympic Peninsula had destinations in Port Angeles).

Cargo content is an important determinant of cargo weight. Table 8-7 summarizes the average ton and value per truck for the four counties. The timber industry tends to be associated with relatively heavy cargo loads and multiple trailer trucks and represent the largest portion of cargo transported on the highways within the study area.

TABLE 8-7
AVERAGE VOLUME AND VALUE OF CARGO SHIPPED FROM COUNTIES

County	Average Tons/Truck	Average Value/Truck	Major Commodities
Clallam	15.79	22, 585	wood, paper products; house-hold goods
Jefferson	20.73	16, 096	wood, paper products; construction equipment
Kitsap	15.91	19, 986	construction materials; logs; household goods; solid waste; recycled material
Mason	20.25	22,912	wood products; construction equipment

Reference: EWITS Research Report No. 9, November 1995

DNR

The Olympic Peninsula Region harvested approximately 660 million board feet of timber in 1995 (i.e. 3 million metric tons) which accounted for 13% of the total state harvest and 17% of Western Washington totals. The majority of the timber products are transported, by truck, from the Olympic Peninsula Region to major ports in Puget Sound for export. The DNR's (Department of Natural Resources) 1994 Timber Harvest Report shows that the majority of the timber harvests were within Clallam and Mason counties (approximately 80% of the total within the study area) and that increase in timber harvest between 1994 and 1995 was highest in Clallam county, or 32% (refer to Table 4 and Appendix G). The annual increase in timber harvest within the region was approximately 17% from 1994 to 1995.

TABLE 8-8
TIMBER HARVEST SUMMARY⁽¹⁾

County	1994 (Thousand Board Feet)	1995 (Thousand Board Feet)	Percentage Increase
Clallam	164,063	242,981	32.5%
Jefferson	74,628	80,540	7.3%
Kitsap	43,319	42,370	-2.2%
Mason	186,077	195,950	5.0%
TOTAL:	468,087	561,841	17.0%

Reference: Larsen, David, Washington Timber Harvest - DNR, 1994

Note: (1) 1994 and 1995 Timber Harvest Summary sheet in Appendix G.

In general, it is difficult to predict the annual amount of timber harvested as it depends on the demand for timber products. Timber harvest contracts are usually conducted under 3 year contracts, but the timber may all be harvested within one year. The mills purchase the timber but contract the freighting out to local trucking companies. Most of the timber is delivered to mills in Port Angeles and Forks. Therefore, if there is an increase in timber harvesting the truck traffic on US 101 and state routes in and around Port Angeles will increase.

Summary of Freight Mobility Survey

The freight mobility survey was accomplished by conducting both in-person and over-the-phone interviews. The objective was to effectively gather freight mobility data from local ports and the trucking and timber industry. During this phase, the facilities contacted included:

- Port of Port Angeles
- Port of Port Townsend
- Port of Bremerton
- Port of Shelton
- Major mills such as K-Ply, Daishowa America, Port Townsend Paper and Allen Logging
- Trucking companies including Puget Sound Transfer, Atlas Trucking, R. Erdmann Trucking, D.A. Development etc.

During subsequent phases, industries associated with freight mobility, such as warehouse facilities and the smaller truck companies, will be contacted. The Washington Trucking Association provided a list of smaller trucking firms that deliver freight to and from the Peninsula that will be included in the future phases of this study.

Preliminary evaluation for this phase indicates that both Port Angeles and Sequim are the major

generators of freight traffic within the region. The study indicates that approximately 143 trucks per day originate from Port Angeles, 67 trucks per day originate from Port Townsend and approximately 80% of the total truck traffic is associated with the timber industry.

The majority of the timber harvest is delivered to mills in Port Angeles, Forks and Port Townsend. From there the timber products are either delivered to local ports for shipment or trucked from the area. Based on this initial phase, the main ports within the study area which have significant freight movement are the Port of Port Angeles and the Port of Port Townsend.

Summary of Concerns

Problem areas and concerns identified by the participants of this survey include:

- US 101 between Discovery Bay and Port Angeles - Traffic volumes and congestion
- In general - Need for additional truck lanes/passing lanes
- US 101 within the Port Angeles and Sequim areas - Traffic congestion
- US 101 in Sequim - Signals are not sequenced to allow adequate flow of traffic
- US 101 between Sequim and Discovery Bay - Need passing lanes
- SR 104 - Need truck lanes
- (SR 16) (approximately 10 miles north of the Tacoma Narrows Bridge) - Traffic back-ups every morning
- SR 104 at Hood Canal Bridge - age may require more frequent construction closures
- In general - Lack of turnouts to pull over to let traffic pass, need passing lanes on all hills
- SR 112 - Need passing lanes to be smoother
- US 101 - Sanding/plowing during winter, particularly south of Forks, is of concern
- US 101 at the Jefferson/Clallam county line - Road maintenance problems
- Seattle/Metro area - Truck volume concentrations could be reduced if the Port facilities were open longer hours (possibly 24 hrs/day) so that much of the freight volume would be delivered to the Port at night
- In general - Amount of commercial traffic on the ferries

- In general - Need scenic spots for RVs and tourists

Most of the freight movement within the region is done in one day, round-trips. Rest areas are used for short breaks and load checks. Suggestions from survey participants on how to solve the problem of rest areas that are experiencing truck traffic beyond their design limits is summarized below (question 14 on the survey form):

- Work together with King and Pierce Counties to attract investors to build larger, more modern truck stop facilities to accommodate the large volume of traffic typical of a regional corridor area. Participants identified the Seattle/Tacoma area as having the worst truck service availability on the west coast.
- Regulate the amount of companies and over the road trucks operating in the state.
- Require RV drivers to have CDLs and follow the same rules as trucks.
- Add rest areas between Port Angeles and the Hood Canal Bridge (SR 104), between Port Angeles and Forks (US 101), and between Port Angeles and Clallam Bay (SR 112).

Summary of Traffic/Truck Counts

Interpreting traffic counts on state highways and local roads is the best way to determine the total number of trucks at selected points on the roads. The total vehicle/truck counts were taken at different "key" locations as identified below:

- SR 104 and SR 3 intersection at the Hood Canal Bridge
- SR 3 north of Shelton
- SR 16 and SR 3 interchange at Gorst
- SR 104 and SR 19 intersection south of Port Townsend
- US 101 and SR 112 intersection west of Port Angeles
- US 101 at Deer Park, east of Port Angeles

The counts were taken at three different times during the day at each location. Each count was recorded in 15 minute intervals for a 2-hour time period (Appendix I and attached Figures 1-1, 1-2 and 1-3). Initial evaluation of these counts indicates that the truck traffic peak is in the morning until noon at these locations. Also, the highest volume of the total traffic within the study area moves across the Tacoma Narrows Bridge, with the Hood Canal Bridge supporting a significant amount of southbound traffic on SR 3 from the northern Olympic Peninsula. These traffic counts also indicate that the Port Angeles and Sequim areas are major generators of freight traffic within the region, with approximately 19% of the total traffic as trucks during the morning hours.

CONGESTED ROADWAY SEGMENTS

As communities grow and experience increased congestion, there are more conflicts between road users, general vehicles and freight. To avoid conflicts and delays, the trucking industry is working to utilize the roads at night and off-peak hours, seeking the path of least resistance, particularly during the summer months when RV traffic is at its peak. Additional facilities are needed to more effectively accommodate the volumes.

Freight travel has several impact on roadways and the roads design characteristics, such as with, alignment, and sight distance. Consequently, freight mobility improvements include capacity, safety and maintenance issues that are important aspects of an effective regional transportation system. Based on the findings of the freight mobility survey the roadway segments of primary concern with respect to congestion and potential freight mobility delays include:

- US 101 in and around the Port Angeles and Sequim areas (likely solved with current by-pass project).
- US 101 between Sequim and Discovery Bay.
- SR 104 at the Hood Canal Bridge due to reduced speed limit caused by bulging.
- Closure of the Hood Canal Bridge due to reconstruction of the east half of the bridge or because of sever weather conditions.
- Tacoma Narrows Bridge, along SR 16, through Gorst, Bremerton and north to the SR 3/SR 305 junction at Poulsbo.

RECOMMENDED SOLUTIONS AND IMPROVEMENTS

Trucking activities influences roadway capacity as well as the identification of future transportation corridors. In general, possible solutions and needs to the congestion problems and delays within the study area include the following:

- Truck lanes/passing lanes (turnouts) on US 101 between Discovery Bay and Port Angeles and on SR 104, particularly on hills. This would be very helpful during the summer months when the tourist traffic and RV's peak.
- Sequencing of signals and intersection improvements on major routes to allow adequate flow of traffic.
- Ferries running across Hood Canal to accommodate for construction and weather closures of the bridge.
- Alternative transportation modes (e.g. freight ferries) to accommodate for freight movement during closure of the Hood Canal Bridge.
- Construction of new routes such as potential development of a new N-S corridor through Kitsap and Mason Counties (US 101 Connector) to accommodate for heavy traffic on Tacoma Narrows Bridge.

- Port facilities open for longer hours so that freight volume can be delivered at night, during low traffic volumes.
- Improve and/or add air freight activities for lighter cargo.
- Freight by barge for heavier cargo, such as lumber, between Sequim, Port Angeles and ports within the Seattle/Metro area.
- Additional transit service.
- Left- and right-turn pockets and channelization.

Improvements

Improvements on the regional roadway system include:

- Reconstruction of the east half of Hood Canal Bridge
- The proposed US 101 Connector
- By-pass project between Port Angeles and Sequim

Bridges are important links in the PRTPO road system, the Hood Canal Bridge in northern Kitsap County is the only bridge (roadway) connecting the Kitsap and Olympic Peninsulas. Other roadway access to the peninsulas must come from the southern end or via ferries.

Reconstruction of the east half of Hood Canal Bridge is scheduled during from the peak tourist traffic months of May 1 - August 30, 1998. Coordination with the Washington State Department of Transportation (WSDOT) and appropriate jurisdictions is necessary in keeping other routes open during closures of the Hood Canal Bridge. Also, other road constructions and/or maintenance within the PRTPO area should be in coordination with the bridge closure.

The proposed US 101 Connector will extend from SR-3 through Bremerton and connect to US 101 just north of Shelton, total of approximately 22 miles. This new road segment is on a plateau and will not be as susceptible to road slides as existing roads around the water (e.g. SR-3 around Bremerton). This will serve as a freight corridor through Olympia and will provide an alternative route for the current freight on the Tacoma Narrows Bridge.

Roadway segments that have been identified in need for passing lanes (turnouts) must conform to WSDOT design standards and have minimum 8-foot with shoulders. This criteria more safely accommodates vehicle mixes, such as recreational vehicles mixed with trucks and automobiles. In some areas topographical constraints may prohibit widening.

Clearly, as growth increases, more improvements and mitigation measures will be needed. Figure X-X graphically depicts those roadways that currently experience capacity deficiencies and Table X-1 contains a summary of the forecasted freight mobility needs for the region.

Financial Element

The financial element addresses funding for regional transportation needs through the year 2010. Regional road needs with respect to freight mobility were identified in the PRTPO Technical Memorandum, Freight Mobility Survey, November 1997. Table 8-9 provides cost estimates for freight mobility needs. Potential funding sources for freight-related transportation needs will be identified later.

CONCLUSION

This chapter reviews freight activity in the PRTPO area. The review indicates that Port Angeles has the most freight activity in the area. The Port of Port Angeles handles shipping and ferry service and attracts significant truck volumes. Nearby is the William R. Fairchild airport, which is the busiest in the region. Kitsap County also has notable trucking activity. SR 3 near Finn Hill Road has one of the highest truck volumes in the PRTPO region. Kitsap County also has four ferry terminals which bring in trucks from the Central Puget Sound area.

As communities grow and experience increased congestion, there are more conflicts between road users, general vehicles and freight. To avoid conflicts and delays, the trucking industry is working to utilize the roads at night and off-peak hours, seeking the path of least resistance, particularly during the summer months when RV traffic is at its peak. Additional facilities are needed to more effectively accommodate the volumes.

Major transportation corridors within the study area are based upon a network of state routes that merge with US Route 101. Most of the freight movement is carried over the Hood Canal Bridge through SR 3 and across the Tacoma Narrows Bridge (approximately 80%). The Port Angeles and Sequim areas have the highest truck volumes with respect to total traffic. This is primarily because of the timber industry and associated port and mill activities within Port Angeles. Both US 101 and SR 3/SR 16 are the key connection highways for the timber industry. Trucks carrying wood products tend to be among the largest and heaviest and raise special concern for the region's tourist and commuter traffic on two-lane portions of US 101.

Based on the 1995 estimated truck traffic information from WSDOT and our interview surveys, the ferry system is infrequently utilized for freight delivery (2% or less).

Table 8-9
PRTPO - Road System Capacity Improvements and Cost Estimates

County	Roadway	Form	To	Improvements	2010 Estimated Costs(M) ⁽¹⁾
					<i>low high</i>
Clallam	US 101	Port Angeles	Sequim	Bypass project	
Clallam	US 101	Sequim	Discovery Bay	Truck climbing/pasing lanes	
Jefferson	SR 20	US 101	Port Townsend	Left-turn pockets	
Jefferson	SR 19	SR 104	Port Townsend	Left-turn pockets	
Jefferson	SR 104	US 101	SR 3	Truck climbing/pasing lanes	
Jefferson/Kitsap	SR 104	Paradise Bay Rd.	Kitsap/Jefferson C.L.	Widen bridge and raise speed limit accordingly	
Kitsap	SR 3	Gorst	Bremerton City Limit	Proposed US 101 Coconnector	
Kitsap	SR 16	SR 3	Tacoma Narrows Bridge		
Mason	SR 3	Shelton City Limits	SR 106	Truck climbing/pasing lanes	
Total					
30% Contingency					
GRAND TOTAL					

Note: (1) Cost Estimates not available at this time.

Table 8-9
PRTPO - Road System Capacity Improvements and Cost Estimates

County	Roadway	Form	To	Improvements	2010 Estimated Costs(M) ⁽¹⁾
					<i>low high</i>
Clallam	US 101	Port Angeles	Sequim	Bypass project	
Clallam	US 101	Sequim	Discovery Bay	Truck climbing/passing lanes	
Jefferson	SR 20	US 101	Port Townsend	Left-turn pockets	
Jefferson	SR 19	SR 104	Port Townsend	Left-turn pockets	
Jefferson	SR 104	US 101	SR 3	Truck climbing/pasing lanes	
Jefferson/Kitsap	SR 104	Paradise Bay Rd.	Kitsap/Jefferson C.L.	Widen bridge and raise speed limit accordingly	
Kitsap	SR 3	Gorst	Bremerton City Limit	Proposed US 101 Connector	
Kitsap	SR 16	SR 3	Tacoma Narrows Bridge		
Mason	SR 3	Shelton City Limits	SR 106	Truck climbing/passing lanes	
Total					
30% Contingency					
GRAND TOTAL					

Note: (1) Cost Estimates not available at this time.